



Water Inventory Teacher Reference

Water – Water Quality

These questions pertain to water quality in and around the school.

	Inventory Questions	Ideas for School Improvement	Resources	Connections to KY Core Content 4.1
1	From where does the school's water come (e.g., well, river, reservoir)?	Based on where your water comes from, create a list of potential sources of contamination. You may want to research the types of industries, farms and neighborhoods near your school to identify the pollution they generate. Explain how this pollution could affect your school's water source. Could your school be contaminating its own water source? For example, school chemical spills, soil erosion from construction and application of pesticides and fertilizers could contribute to contamination. If so how can you reduce the risk of contamination? Implement some of your ideas. Create a chart that lists maximum levels of contaminants in drinking water and the impact on human health for each of these contaminants if their safe drinking water levels are exceeded. Analyze your school's water using the Consumer Confidence Report. Does your school meet all the requirements for safe drinking water? Create school grounds	All the rules and information on drinking water Consumer Confidence Report http://water.ky.gov/dw/	Primary SC-EP-4.7.1 Students will describe the cause and effect relationships existing between organisms and their environments SS-EP-4.1.3 Students will use geographic tools to identify major landforms, bodies of water and natural resources on Earth's surface. PL-EP-3.3.02 Students will identify the available health and safety agencies in a community that provide services: <ul style="list-style-type: none">• Health department• Fire department• Sanitation• Police• Ambulance services DOK 1
2	What is the quality of that source? (e.g. How does the Kentucky Division of water define water quality?)		DOW Web site on definition of water quality http://water.ky.gov/sw/ Go to water Quality Branch Information on "designated uses", how water quality is measured.	Fourth grade SC-04-4.7.1 Students will make predictions and/or inferences based on patterns of evidence related to the survival and reproductive success of organisms in particular environments. SC-04-4.7.2 Students will <ul style="list-style-type: none">• describe human interactions in the environment where they live;• classify the interactions as beneficial or harmful to the environment using data/evidence to support conclusions. PL-04-3.3.02 Students will identify and explain the available health and safety agencies in a community that provide services: <ul style="list-style-type: none">• Health department• Fire department• Sanitation• Police• Ambulance services DOK 2
3	What is the quality of the school's drinking water (e.g., level of contaminants, lead, mercury, PCBs, bacteria, added fluoride)?		An explanation of the Consumer Confidence Report http://water.ky.gov/sw/	
4	Is the person who tests the water a certified operator?		Teach about water pollution with these units of study http://keec.ky.gov/waterunit.htm	
5	Where is the school's Consumer Confidence Report posted? (e.g., Principal's office, school board office)		A primer on water quality from the U.S. Geologic Survey http://pubs.usgs.gov/fs/fs-027-01/index.html	
6	Where does water from the school grounds drain (e.g., local stream, sinkhole, name of watershed)?		Ask the facilities manager in the principal's office or in the district office. http://water.ky.gov/dw/	
7	What is the water quality of a nearby stream?		The Division of Water, Water Watch program describes the effects of water quality on aquatic life and provides instruction on water testing for common pollutants. http://www.water.ky.gov/ww/ Describes nonpoint source or runoff pollution generated by stormwater or snowmelt. Treatment of runoff pollution directly affects the cost and quality of drinking water. http://water.ky.gov/sw/nps/ Search out water and hydrologic cycle http://www.epa.gov Healthy Water, Healthy People http://www.healthywater.org/ See listing for Freshwater Benthic Ecology and Aquatic Entomology Homepage pages 159 and 178 The National Geographic Map Machine provides theme maps and other locational information. http://plasma.nationalgeographic.com/mapmachine/ The Center for Watershed Protection describes improved methods for economic development that protect water resources. Known as Low Impact Development (LID) these methods offer long-term strategies to solve water pollution problems from runoff pollution and protection of water quantity by providing the best solutions to groundwater	



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		<p>landscaping plan that reduces water runoff</p> <ol style="list-style-type: none">1. Create buffer zones to slow and absorb runoff.2. Plant grass in the place of concrete3. Cover bare soil with native vegetation4. If the school is adjacent to a stream plant a riparian zone along the stream to absorb runoff.5. Identify if there are areas of your landscape plan where outdoor learning could take place. <p>Present the plan to your site based council.</p> <p>Adopt a nearby stream and join the Water Watch program.</p> <ul style="list-style-type: none">• Conduct a biological and chemical test of a nearby stream• Maintain/create riparian buffer zones	<p>recharge. http://www.cwp.org/</p> <p>Explains the connection between human activity & water pollution http://clean-water.uwex.edu/pubs/storm.htm http://www.cwp.org/</p> <p>Nonpoint source web page http://www.water.ky.gov/sw/nps</p> <p>Surf your watershed. Search by Zip code, address etc. http://www.epa.gov/surf/</p> <p>2004 303(d) list of impaired waters in the Commonwealth and their priority status http://water.ky.gov</p> <p>The Commonwealth Water Education Project http://www.inyourwater.org/</p>	<p>Fifth grade</p> <p>SC-05-2.3.1 Students will</p> <ul style="list-style-type: none">• describe the circulation of water (evaporation and condensation) from the surface of the Earth, through the crust, oceans, and atmosphere (water cycle);• explain how matter is conserved in this cycle. <p>DOK2</p> <p>SC-05-4.7.1 Students will</p> <ul style="list-style-type: none">• describe and categorize populations of organisms according to the function they serve in an ecosystem (e.g., producers, consumers, decomposers);• draw conclusions about the effects of changes to populations in an ecosystem. <p>SS-05-4.1.3 Students will explain how physical characteristics (e.g., landforms, bodies of water, climates, vegetation) influence where things are located (e.g. house, factory, store, playground, park, bridge, dam). DOK 2</p> <p>PL-05-3.3.02 Students will identify and describe the available health and safety agencies in a community that provide services:</p> <ul style="list-style-type: none">• Health department• Fire department• Sanitation• Police• Ambulance services <p>DOK 2</p> <p>Sixth grade</p> <p>SC-06-4.7.1 Students will describe the consequences of change in one or more abiotic factors on a population within an ecosystem.</p> <p>SS-06-4.3.1 Students will describe patterns of human settlement in the present day and explain how these patterns are influenced by human needs. DOK 2</p> <p>PL-06-3.3.02 Students will identify and describe a range of resources and services provided by community agencies:</p> <ul style="list-style-type: none">• Public health department• Fire department• Police department• Family resource center <p>DOK 2</p>
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				<div>Seventh grade</div> <div>SC-07-4.7.1 Students will compare abiotic and biotic factors in an ecosystem in order to explain consequences of change in one or more factors.</div> <div>PL-07-3.3.02 Students will identify and describe resources and services provided by community agencies:<ul style="list-style-type: none">Public health departmentFire departmentPolice departmentFamily resource center DOK 2</div> <div>Eighth grade</div> <div>SC-08-4.7.1 Students will describe the interrelationships and interdependencies within an ecosystem and predict the effects of change on one or more components within an ecosystem.</div> <div>PL-08-3.3.02 Students will identify and explain the importance of resources and services provided by community agencies and how these resources benefit the overall community.<ul style="list-style-type: none">Public health departmentFire departmentPolice departmentFamily resource center DOK 2</div> <div>High School</div> <div>SC-HS-4.7.1 Students will<ul style="list-style-type: none">analyze relationships and interactions among organisms in ecosystems;predict the effects on other organisms of changes to one or more components of the ecosystem.</div> <div>SC-HS-4.7.2 Students will<ul style="list-style-type: none">evaluate proposed solutions from multiple perspectives to environmental problems caused by human interaction;justify positions using evidence/data.</div> <div>SS-HS-4.4.1 Students will explain how humans develop strategies (e.g., transportation, communication, technology) to overcome limits of their physical environment.</div> <div>PL-HS-3.3.01 Students will compare consumer actions (reuse, reduce, recycle, choosing renewable energy sources, using biodegradable packaging materials, composting) and analyze how these actions impact the environment (e.g., conserving resources; reducing water,</div>
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				air, and land pollution; reducing solid waste; conserving energy; greenhouse effect, slowing global warming). DOK 3
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Water – Water Management				
This section includes questions about the management of wastewater coming from the school and runoff pollution from around the school.				
	Inventory Questions	Ideas for School Improvement	Resources	Connections to KY Core Content 4.1
8	Who is the school's sewage provider? (e.g. city, county, septic tank?)	Make a map of the school's gutters and down spouts. Determine where each down spout drains. Determine flow from down spouts to learn how much water drains from school roof. Establish a plan for reducing or slowing water coming off of roofs and downspouts. Identify problem spots on school grounds where erosion often occurs. Create an outdoor classroom or butterfly, ozone, or rain garden at the problem area using native vegetation, stones and mulch.	Refer to your school's water bill. Ask the facility manager located onsite or at the district office. Information on Water Education and Water Management topics http://wateroutreach.uwex.edu Take an "Electronic Fieldtrip to a Watershed" at http://www.ket.org/trips/ Fifteen ways to protect your watershed. http://www.epa.gov/owow/watershed/earthday/earthday.html Storm water resources http://www.inyourwater.org/ Information on nonpoint source stormwater management http://www.dnr.state.wi.us/org/water/wm/dsfm/shore/documents/rqmanual.pdf Photos of different kinds of erosion and how to stop erosion http://managingwholes.com/photos/erosion/index.htm A list of county conservation district offices and contact information. http://www.conservation.ky.gov/condistricts/ The Commonwealth Water Education Project http://www.inyourwater.org/	Primary SC-EP-4.7.1 Students will describe the cause and effect relationships existing between organisms and their environments SS-EP-4.1.3 Students will use geographic tools to identify major landforms, bodies of water and natural resources on Earth's surface. Fourth grade SC-04-4.7.1 Students will make predictions and/or inferences based on patterns of evidence related to the survival and reproductive success of organisms in particular environments. SC-04-4.7.2 Students will <ul style="list-style-type: none">describe human interactions in the environment where they live;classify the interactions as beneficial or harmful to the environment using data/evidence to support conclusions. Fifth grade SC-05-2.3.1 Students will <ul style="list-style-type: none">describe the circulation of water (evaporation and condensation) from the surface of the Earth, through the crust, oceans, and atmosphere (water cycle);explain how matter is conserved in this cycle. DOK2 SC-05-4.7.1 Students will <ul style="list-style-type: none">describe and categorize populations of organisms according to the function they serve in an ecosystem (e.g., producers, consumers, decomposers);draw conclusions about the effects of changes to populations in an ecosystem.
9	How much money was spent last school year on wastewater for your school? For what was that money used?			
10	Where does water from the parking lot, gutters, downspouts and other impervious surfaces drain (e.g., storm drain, sanitary sewer, stream, rain garden, drainage ditch, retention pond)?			
11	Does your school have any areas with bare soil where erosion can wash silt into nearby streams?	Refer to the chemicals section of the Green and Healthy Schools program, and develop a hazardous chemical management plan.		
12	Does the school have a plan to deal with hazardous material spills (including paint, oil, and pesticides) that might go down drains and impact waterways?			



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13	Does the school have a plan for managing the runoff from the school property?			<p>SS-05-4.1.3 Students will explain how physical characteristics (e.g., landforms, bodies of water, climates, vegetation) influence where things are located (e.g. house, factory, store, playground, park, bridge, dam). DOK 2</p> <p>Sixth grade</p> <p>SC-06-4.7.1 Students will describe the consequences of change in one or more abiotic factors on a population within an ecosystem.</p> <p>SS-06-4.3.1 Students will describe patterns of human settlement in the present day and explain how these patterns are influenced by human needs. DOK 2</p> <p>Seventh grade</p> <p>SC-07-4.7.1 Students will compare abiotic and biotic factors in an ecosystem in order to explain consequences of change in one or more factors.</p> <p>Eighth grade</p> <p>SC-08-4.7.1 Students will describe the interrelationships and interdependencies within an ecosystem and predict the effects of change on one or more components within an ecosystem.</p> <p>High School</p> <p>SC-HS-4.7.1 Students will</p> <ul style="list-style-type: none">• analyze relationships and interactions among organisms in ecosystems;• predict the effects on other organisms of changes to one or more components of the ecosystem. <p>SC-HS-4.7.2 Students will</p> <ul style="list-style-type: none">• evaluate proposed solutions from multiple perspectives to environmental problems caused by human interaction;• justify positions using evidence/data. <p>SS-HS-4.4.1 Students will explain how humans develop strategies (e.g., transportation, communication, technology) to overcome limits of their physical environment.</p>
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Water – Water Conservation				
These are the questions to explore in the water conservation section of the water inventory.				
	Inventory Questions	Ideas for School Improvement	Resources	Connections to KY Core Content 4.1
14	Who is the school's water provider (e.g., private company, municipality, school-owned)?	<div>Develop a proposal for reducing your school's water usage by 5%. This may include:</div> <ul style="list-style-type: none">a policy that requires old toilets be replaced with water efficient ones and faucets be installed with automatic switchersa plan for reducing watering of the school lawn. <div>This may include converting lawn to native gardens that require less water.</div> <ul style="list-style-type: none">A system for collecting rain water coming from roofs and gutters that can be used to water gardenseducation for students, faculty and staff on the importance using less water, reporting leaking faucets, etc. <div>Present the proposal to</div>	Ways to save water around the house that may also be useful at school http://www.h2ouse.org/ 100 ways to use water wisely http://www.wateruseitwisely.com/100ways/ne.shtml More water saving ideas from consumer reports http://www.consumerreports.org/cro/personal-finance/50-ways-to-save-water-805/index.htm Example of a home water audit http://www.wateruseitwisely.com/familywater/index.shtml Find out more about drought and how to plan ahead to conserve water http://www.state.nj.us/drbc/drought/kids_droughtinfo.htm Lots of ideas for teaching about water http://www.projectwet.org/ and http://keec.ky.gov/project_wet.htm A Kentucky curriculum on water - aligned to the core content and inquiry based http://keec.ky.gov/waterunit.htm	Primary MA-EP-1.1.1a Students will read, write, and rename whole numbers (0 to999) and apply to real-world and/or mathematical situations. DOK 2 MA-EP-4.3.1a Students will pose questions that can be answered by collecting data Fourth Grade MA-04-1.1.1a Students will read, write, and rename whole numbers, fractions, and decimals, and apply to real-world and/or mathematical situations. MA-04-4.3.1a Students will pose questions that can be answered by collecting data. DOK2 Fifth grade MA-05-1.1.1a Students will read, write, and rename whole numbers, fractions, and decimals, and apply to real-world and/or mathematical situations DOK2 MA-05-4.3.1a Students will describe and give examples of the process of using data to answer questions (e.g., pose a question, plan, collect data, organize and display data, interpret data to answer questions) Sixth Grade MA-06-1.3.1 Students will add, subtract, multiply, divide, and apply order of operations with whole numbers, fractions, and decimals to solve real-world problems. DOK - 2 Seventh Grade MA-07-1.3.1 Students will add, subtract, multiply, divide, and apply order of operations (including
15	How much money was spent on water at your school during the last school year?			
16	How many gallons of water did the school use last year?			
17	On average, how much water do school toilets use per flush? (in gallons)			
18	Does the school have water faucets that turn off automatically?			
19	Are water faucets located outside the building secure?			
20	How often are all water pipes and faucets checked for leaks and other maintenance?			
21	How and when are school lawns watered?			
22	How many gallons of water does each student use per school day?			
23	How is water conservation part of every grade's curriculum?			
24	Who conducted the Water Inventory (e.g., Mrs. Frost's seventh grade classes, Mr. Pipe, maintenance worker, and the local water district)?			



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		<p>your principal and/or site based council.</p> <p>Conduct a water loss audit</p> <ul style="list-style-type: none">• Check faucets, toilets, hoses and outdoor faucets for leaks. (Include faucets in the kitchen and maintenance room).• Complete work orders to have leaks repaired. <p>Follow-up to see that leaks are repaired.</p> <p>Conduct research to find out if your community has been under any water use restrictions due to drought in the past 5 years. What restrictions were imposed? Interview local officials (mayor, county judge executive, magistrates) to find out if your community has a plan for dealing with droughts.</p>		<p>positive whole number exponents) with whole numbers, fractions, and decimals to solve real-world problems. DOK - 2</p> <p>Eighth Grade</p> <p>MA-08-1.3.1 Students will add, subtract, multiply, divide, and apply order of operations (including positive whole number exponents) with rational numbers to solve real-world problems. DOK - 2</p> <p>High School</p> <p>MA-11-4.1.1 Students will analyze and make inferences from a set of data with no more than two variables, and will analyze situations for the use and misuse of data representations. DOK - 3</p>
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